

# INFOWIND BRAZIL

Infowind nº 10 | Update 2019 April, 17



**MORE THAN:**

**15<sub>GW</sub>**

OF INSTALLED  
CAPACITY

**600**

WIND  
FARMS

**7,500**

TURBINES IN  
OPERATION



## AND HOW MANY ENERGY DO THEY GENERATE?

### WHAT DOES THIS GENERATION MEAN?



AN AVERAGE OF  
25.5 MILLION HOUSEHOLDS  
WERE SUPPLIED BY WIND  
POWER MONTHLY IN 2017



AROUND  
80 MILLION  
PEOPLE



In 2018 wind generated a total of 48.4 TWh of wind energy



This generation represents 8.6% of the entire generation injected into the National Interconnected System in the period



It was perceived a growth of 14.6% in relation to the generation of the previous year (2017) compared to the 1.5% growth of the generation of the entire SIN generation (National Interconnected System).

(Source: CCEE/ ABEólica)



Considering the auctions and contracts performed within the free market, Brazil will have approximately 19.4 GW of wind energy capacity installed until 2023.

## RECORDS

### NORTHEAST

On September 13, 2018, **74.12% of all energy used in the northeast** came from wind farms operating at a 76.58% capacity factor and a generation of 7,839 MWmed.

### SOUTH

On September 1<sup>st</sup>, 2018, **13.72% of the energy used in the south** came from wind farms operating at 77.22% capacity factor and generation of 1,541 MWmed.

### NORTH

On September 13, 2018, **3.95% of energy used in north** came from wind farm at a 97.65% capacity factor and generation of 215 MWmed.

### SIN National Integrated System

On September 12, 2018, **13.98% of all energy used in the National Integrated System** came from wind farms operating at a 72.30% capacity factor and generation of 8,983 MWmed.

## FAVORABLE WINDS IN BRAZIL

**42%**

was the Average Capacity Factor in Brazil in 2018.

The average capacity factor for wind farms worldwide is around

**25%**

From July to November, the windy season, the capacity factor for Brazil can be higher than 60%.

### Why are winds in Brazil so good?



Same direction



Constant

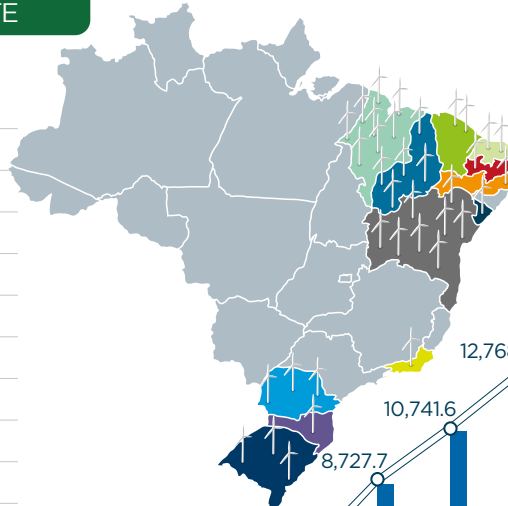


Stable (Speed)

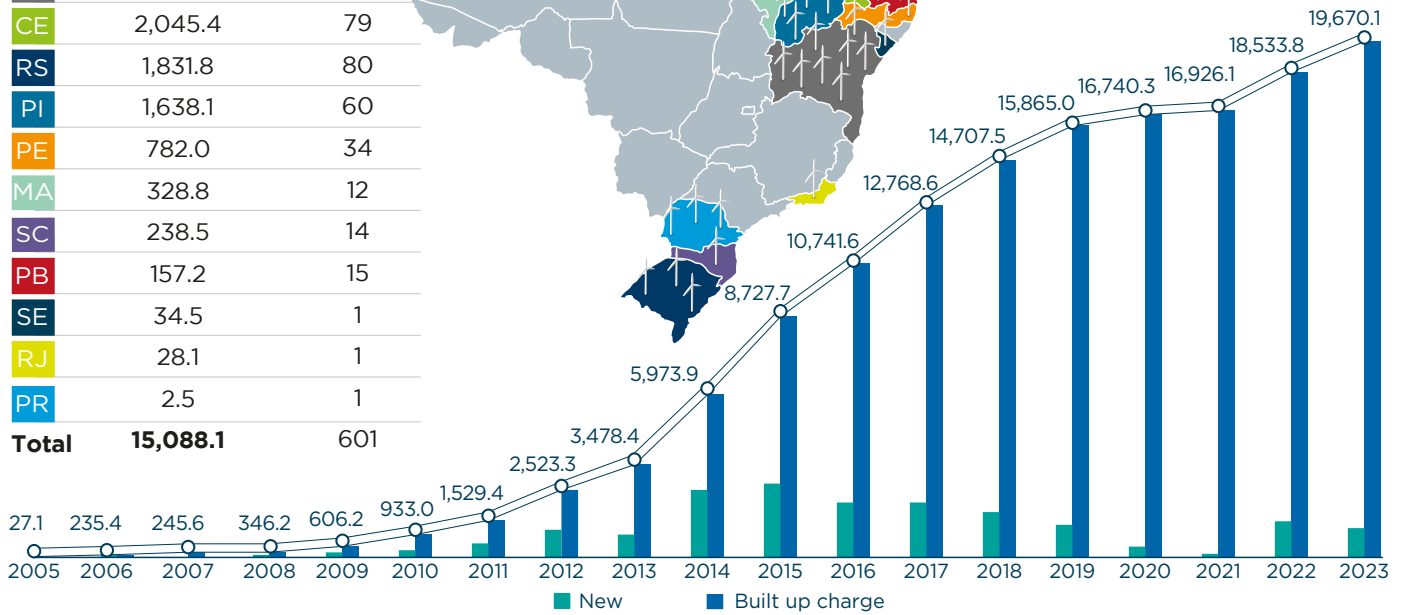
Such winds are abundant in Brazil, especially in the northeast and south.

## INSTALLED CAPACITY AND WIND FARMS BY STATE

STATE	POTENCY (MW)	FARMS
RN	4,066.1	151
BA	3,935.0	153
CE	2,045.4	79
RS	1,831.8	80
PI	1,638.1	60
PE	782.0	34
MA	328.8	12
SC	238.5	14
PB	157.2	15
SE	34.5	1
RJ	28.1	1
PR	2.5	1
<b>Total</b>	<b>15,088.1</b>	<b>601</b>



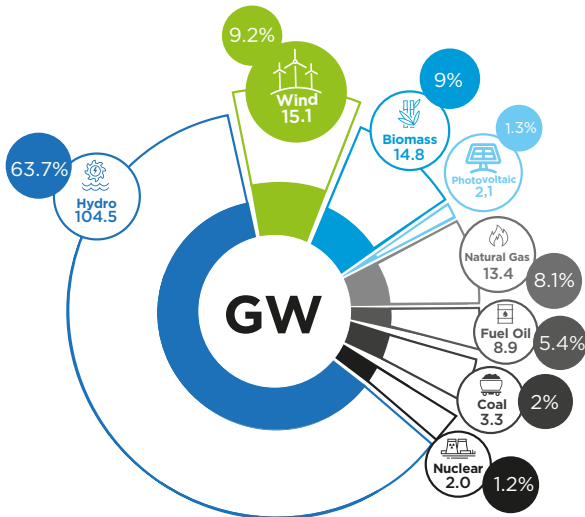
## GROWTH OF INSTALLED CAPACITY (MW)



Source: ANEEL/ABEEólica

Future data in the chart above comes from contracts already confirmed in auctions and transactions completed in the free market. New auctions will add further capacity in coming years.

## SOURCES OF ENERGY IN BRAZIL (GW)



## INTERNATIONAL COMPARISONS

Brazil is ranked 8<sup>th</sup> in the World Ranking of wind energy installed capacity. In 2012, Brazil was ranked 15<sup>th</sup>.



Source: ANEEL/ABEEólica

Source: GWEC

## BENEFITS OF WIND ENERGY

- Wind power is renewable, non-polluting, has low environmental impact and helps Brazil fulfill its Climate Agreement Goals.
- Wind parks do not emit CO<sub>2</sub>.
- The best prices for energy offered at the December 2017 auctions came from wind farms.
- Generates income and improve the quality of life of land-owners who lease their land for wind tower placement. There are now some 6,500 such towers in operation in Brazil. We believe some 4,000 families are receiving over R\$ 10 million a month in total from leasing land for towers.
- Enables land-owners to continue planting their crops or growing their animals.
- Provides training and qualifications for local labor.

## CONTRIBUTIONS TO WIND ENERGY IN BRAZIL

Every MW installed = 15 jobs  
Meaning wind energy has already created 190 thousand jobs.

From 2010 to 2017 the investment in the sector was US\$ 32 billion

Wind energy avoided the emission of about 23 million tons of CO<sub>2</sub> in 2017. This is equivalent to the annual emissions of some 18 million automobiles

2017 = US\$ 3.57 billion

Source: Bloomberg New Energy Finance - BNEF / MCTI / ABEEólica